Kimley-Horn and Associates, Inc.

EXHIBIT A.1

July 5, 2011

Ms. Renee C. Lawrence
Civil Engineer II
Department of Water Management
Utility Engineering
101 City Hall Plaza
Durham, NC 27701

P. O. Box 33068
Raleigh, North Carolina
27636-3068

Re: **Scope for Professional Engineering Services for the Teer Quarry Raw Water Storage and Pumping Facility Preliminary Site Design Phase**

Dear Renee:

Kimley-Horn and Associates, Inc. is pleased to submit our proposed Scope of Services for the City of Durham's Teer Quarry Raw Water Storage and Pumping Facility – Preliminary Site Design Phase.

I. GENERAL SCOPE OF SERVICES

A. The general Scope of Services for the Preliminary Site Design Phase work associated with this project will consist of preliminary engineering services, including gathering existing data and reports from the City, performing required planimetric and topographic field surveys and property surveys, geotechnical investigations, electrical and structural evaluations, and evaluating the regulatory and environmental permitting requirements for the "Preliminary Site Design Phase Facilities". The goal of this first phase is to assist the City with its decision making of which options are in the City's best interest and to establish a solid foundation for the City to pursue an emergency off-line water storage facility and a longer term "on-line" fully operational facility.

B. The Scope of Services and associated fees indicated herein are based on keeping the initial scope of the project within the requirements of the approved FONSI previously received by the City in September 2010. The FONSI clearly limits the use of the Teer Quarry to an "emergency off-line water storage facility" only allowing the facility to be filled either by gravity or pumping from the adjacent Eno River and then subsequently pumping from the quarry into the City's raw water system through the existing 42" raw water pipeline.

C. The Scope of Services indicated herein will also take into account establishing the groundwork required for the City to convert the Teer

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Quarry facilities from an emergency off-line water storage facility to an on-line long term fully operational facility.

The Scope of Services indicated herein is divided into the following tasks:

II.A PRELIMINARY ENGINEERING SERVICES

II.A.1 SITE/CIVIL ENGINEERING

1. Perform hydraulic evaluations and conceptual designs for the proposed Preliminary Site Design Phase facilities, including associated conceptual designs:
    - Three (3) alternative gravity flow options from the Eno River to the Teer Quarry.
    - Three (3) alternative pumping options from the Eno River to the Teer Quarry, including the existing Eno River Pump Station.
    - Two (2) alternative Eno River Raw Water Intake layouts; and
    - The Teer Quarry Raw Water Pumping Station including alternatives for pumping into the existing 42" raw water pipeline.

    Note: All scenarios evaluated will be based on a maximum water level of EL. 285.00 in the Teer Quarry.

2. Perform an evaluation for the feasibility of utilizing temporary "stand-by" Godwin type trailer mounted pumps to pump water from the quarry into the existing raw water pipeline through either the existing 42" connection or an alternative pipe connection.

3. Perform a limited hydraulic analysis and pipeline capacity and condition assessments of the existing 42" raw water pipeline.

4. Perform an evaluation of the multiple control valve options required to permit water to be conveyed into and out of the quarry and to direct it to the appropriate treatment facility.

5. Perform an evaluation of the viable options for converting the Teer Quarry facilities from an emergency off-line water storage facility to an on-line fully operational facility as indicated in Paragraph I.C, hereinabove.

6. Perform an evaluation of the feasibility of installing an earthen embankment required to provide for the containment of water in the quarry up to the desired capacity level of EL. 285.00.

7. Perform an evaluation of any additional property acquisition(s) required for placing an earthen embankment on the site to a height necessary to provide for the containment of water in the quarry up to the desired capacity level of EL. 285.00.

8. Perform an evaluation of the potential effects of placing additional fill materials required for the installation of an earthen embankment, on the existing 42" PCCP raw water pipeline.

9. Perform an evaluation of the security requirements necessary to secure the site for both the Teer Quarry Raw Water Storage and Pumping facilities.

10. Perform an assessment of the potential *alternative potential funding sources* under the state's SRF "Green Funds" program.

11. Identify all of the required regulatory and environmental permits necessary for the Teer Quarry Raw Water Storage and Pumping facilities. [*Note: It is our understanding that an EA is currently being performed for potential upgrades to the Brown WTP and the outcome of this EA could have a significant impact on the Teer Quarry Raw Water Storage and Pumping facilities.*]

12. Provide an updated Supplemental Preliminary Engineering Report (S-PER) as required to address viable inflow and outflow options for the quarry.

13. Provide an accurate and detailed opinion of probable construction costs (OPCC) for the updated requirements.

14. Provide property owner notification letters for the properties identified to require preliminary site investigations requiring a "Right of Entry" letter to access the property, in the area where the actual quarry work will occur. We envision that this will primarily be Hanson Aggregate, but there may be others at or near the Eno River. These letters will be posted and mailed out by Kimley-Horn, on City of Durham letterhead with a City signature. Registered Mail return receipt will be required.

15. The Scope of Services will include four (4) review and coordination meetings with City staff during the Preliminary Site Design Phase.

II.A.2 INITIAL ENVIRONMENTAL EVALUATIONS AND REGULATORY REVIEWS

KHA will delineate wetlands and streams and confirm determinations with the Division of Water Quality (DWQ), the U.S. Army Corps of Engineers (USACE), the City of Durham, and/or Durham County.

1. Wetland and Streams Delineation – KHA will conduct a field investigation of the entire Teer Quarry site to determine the absence or presence of wetlands and state open waters within the study area utilizing the three parameter approach for wetland delineation as described in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. The jurisdictional limits will be flagged following the guidelines presented in the 1987 *U.S. Army Corps of*

Engineers Wetland Delineation Manual. Data forms required for certification by the USACE and DWQ will be completed with the data necessary and obtained during field reviews. Any jurisdictional streams will be classified as either perennial or intermittent. The delineated wetland and stream boundaries will be flagged and GPS located.

2. Streams Buffer Conformance – Based on the presence of potential streams on the NRCS Soil Survey and USGS 1:24,000 topographic map, KHA will coordinate its determination of applicable buffer requirements with the City, County, and/or DWQ for the Neuse River Basin.

3. Wetland and Stream Mapping - In order to prepare a Jurisdictional Determination Map for certification by the USACE, the wetland/stream areas will need to be related to a boundary survey. We will provide a sketch of the approximate location of the wetlands and streams as well as our GPS data to our surveyor for field locating. KHA will review the completed wetland/stream surveyed map prior to submission to the USACE. It is anticipated that no field time will be required to review the survey.

4. KHA will seek to obtain certification of the surveyed wetlands line and streams from the City/County, DWQ, and/or USACE. An application will be made to the USACE consisting of a letter, the wetland survey and the required Data Forms. It is anticipated that one site inspection will be required with the City, DWQ, and/or USACE. KHA will review the final delineation in the field with City/County, DWQ, and/or USACE representatives. KHA will perform any minor modifications to the jurisdictional line that may be deemed necessary by the City/County, DWQ, and/or USACE in order to obtain their concurrence. The USACE may sign the map or may choose to provide a preliminary jurisdictional determination.

5. Permit Review – According to existing City documentation a FONSI was issued for the Project on 09/07/2010. The FONSI precludes withdrawing water to fill the quarry from either Lake Michie or Little River. KHA understands that the City does not want to jeopardize its allowance for “zero release” from Lake Michie as a part of the Phase I project scope. *KHA will coordinate a meeting with the City to review the permitting prior to contacting the associated regulatory agency.* Also, some of the alternatives to be considered as part of this Phase may go beyond the scope of the EA and FONSI as well. KHA proposes reviewing the programs, regulations, approvals, and permits that may be required by the agencies identified herein below.

    - Division of Water Resources (water withdrawal for the Eno River only)
    - NC Flood Mapping Program (FEMA and Flood Study requirements)
    - USACE (404 Permit to impact jurisdictional features)

- DWQ (corresponding 401 Water Quality Certification and Riparian Buffer Authorizations)
- Division of Land Resources (Dam Safety Requirements)
- City of Durham Planning and Stormwater (Site Plan Review Requirements)
- Durham County (Stormwater and Buffers)
- Division of Environmental Health (SEPA/Clearing House coordination)
- Public Water Supply (Potable Water and Classification as a Drinking Water Source)
- US Fish and Wildlife Service and Division of Wildlife Resources (Species Issues)

The review may include contacting key individuals with these agencies or reviewing materials, rules, and ordinances provided by these agencies. KHA will also assess any additional environmental requirements that may be discovered as part of this process. KHA will include these findings and recommended approaches in the S-PER.

II.A.3 INITIAL STRUCTURAL EVALUATIONS

1. Perform a preliminary evaluation of the various structural components associated with the Teer Quarry for both the Preliminary Site Design Phase facilities and for conversion of the quarry facility to an on-line long term fully operational facility.

2. The level of structural services identified herein will account for over 20% of the actual final design of the project. Tasks associated with these preliminary structural evaluations will include the following:

    - Review preliminary geotechnical information and recommendations for potential structures. Determine if additional geotechnical investigations will be required to substantiate and/or confirm preliminary structural design parameters.
    - Develop preliminary structural plans (~5 sheets) with potential structure sizes, substructure and superstructure layouts, and foundation designs including bridge piers and rock support systems. These components include the Eno River Raw Water Intake and the Teer Quarry Raw Water Pumping facilities.
    - Develop preliminary designs for required retaining walls, and for any earthen embankment features including overflow spillways, inlet structures, and existing quarry wall improvements.

    - Perform internal QA/QC reviews and address any final comments or preferred recommendations from the City.

- Prepare an OPCC for the structural components including quantity take-offs and costs.
- KHA will include these findings and recommended approaches in the S-PER.

II.A.4 INITIAL ELECTRICAL EVALUATIONS

1. Perform a preliminary evaluation of the sizable electrical requirements for providing adequate power to the quarry site for each of the various components and phases.

2. Perform an evaluation of the existing electrical facilities at the Eno River Pump Station and the treatment plant both located on the quarry site.

II.A.5 INITIAL SURVEYING SERVICES

1. The initial surveying service will include boundary survey computations and ties to the North Carolina Grid Coordinate System and USGS for vertical controls, setting of property irons at all of the City of Durham property corners within the quarry site, and establishing temporary bench marks (TBM's) strategically located throughout the site to be used for the final design phase.

2. Conduct deed research in accordance with the requirements of Durham County and the City of Durham, as required to establish the existing property lines, existing right-of-ways, existing easements and proposed easement lines. Additional research will be performed as necessary to uncover any missing easements or discrepancies in the City's existing easements, if they exist. Existing property lines will be mapped based on existing property monuments and recorded deeds and plats. These field surveys do not constitute a boundary survey of the entire parcel external to the City of Durham's property, unless required to perform a complete survey, but instead is intended to provide sufficient information for the preparation of property acquisition plats, and easements, as determined appropriate.

3. Preparation of topographical and location surveys of the entire rim of the quarry based on a 100-foot buffer from the top of the quarry.

4. Locate the existing 42" and 24" pipelines that traverse the Teer Quarry site from the Eno River to the exit location on the southern boundary of the site and clearly delineate their locations based on Level A SUE provided herein.

5. Preparation of topographical and location surveys for three (3) potential gravity raw water pipe alignments approximately 40-feet wide, from the Eno River to the Teer Quarry. These alignment surveys will also include locations of existing utilities to be affected by the proposed facilities.

6. Locating wetlands and streams and flagging the same for environmental evaluations.

7. Obtain sufficient information for Kimley-Horn to develop a potential permanent, unrestricted access road to the quarry site.

8. Preparation of topographical and location surveys of up to three (3) 1-acre sites (including the existing Eno River Raw Water Intake and Pump Station site) for potential raw water intake facility locations.

9. Preparation of topographical and location surveys of up to two acres for the potential Teer Quarry Raw Pump Station facility location. Please note that some of this survey will already be accounted for with the information obtained in Paragraph 3 above, as a part of the rim survey.

10. Provide cross-section surveys of the Eno River at the selected gravity locations and the proposed raw water pump stations. This will include a corridor length of 100-feet upstream and downstream of each location and a width of 60-feet on each side of the river bank.

11. Provide staking of approximately 50 geotechnical boring and SUE test hole locations.

II.A.6 INITIAL SUBSURFACE GEOTECHNICAL INVESTIGATION

1. Perform a review of the complete records of the Nello Teer Quarry's annual reports that they were required to submit to the state while the quarry was in operation and the final report upon the closure of the quarry as an actively mined facility. Hanson Aggregate may also have similar reports and we will try to request these as well.

2. Perform a preliminary site visit to walk through the site to review the access conditions, extent of site clearing required, choice of drill rigs required, and any other issues related to geotechnical investigations.

3. Review the background history on the quarry and any and all field investigation work done to date. In addition, review State records on the quarry and USGS maps to assess geological conditions in the immediate vicinity.

4. Conduct a geophysical instrumentation survey of the site. The intent of geophysical survey is multi-fold. The aerial photograph of the active Teer Quarry from 1994 stands in significant contrast with the abandoned quarry from a 2010 aerial photograph.

The 1993 aerial indicates that the quarry maintained two deep pits which were separated by a narrow divide. This configuration provides important design characteristics for drinking water supplies to the City of Durham. These design factors include:

- A separate settling basin configuration to assisting in the removal of the received sediment laden waters from the neighboring Eno River.
- A source of clarified water from the adjacent mined basin.

5. As part of the overall project site geotechnical evaluation for this facility, it is important that the following geophysical activities be carried out:

    - An evaluation of existing data base to better identify the concerns that may need additional evaluation. This evaluation process will involve the review of previous engineering and geological studies, and a review of the mine data from state and Nello L. Teer records. We believe this information will assist in the establishment of a baseline volume estimate of the mine before sediment laden Eno River water is introduced.

6. Perform a complete multi-frequency acoustical sub-bottom profile to establish the depth and existing loose sediment thickness over the quarry bottom.

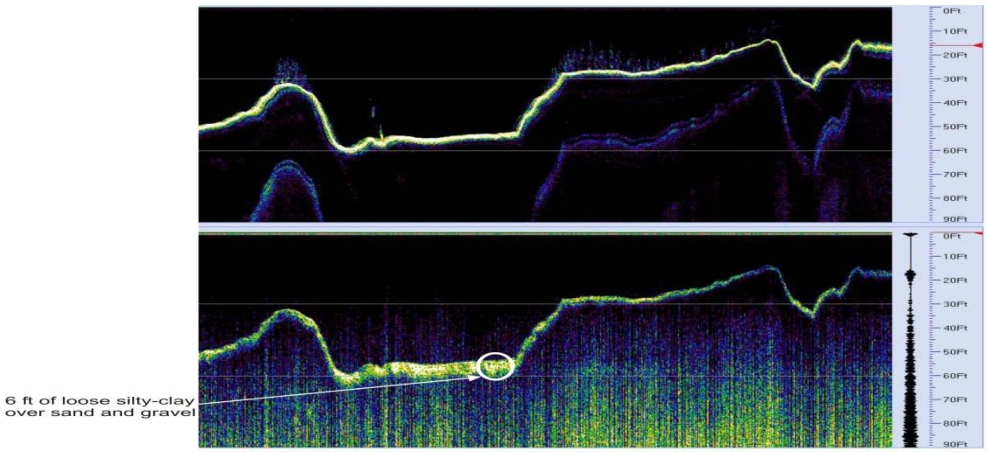
7. Perform a complete shallow surface geophysics evaluation to assist in the development of the understanding of the mined sidewall stability in anticipation of the construction of a periphery containment dike surrounding the quarry basin. These activities will include two types of seismic investigations: 1) seismic refraction (providing vertical distribution of seismic pressure wave velocities); and 2) multi-channel analysis of surface waves (MASW) to provide vertical distribution of shear wave velocities (this provides an understanding of soil stiffness).

8. Perform a review of existing North Carolina Land Management mine records, potential existing records of the Nello L. Teer operations, and previous evaluations conducted on behalf of Durham.

9. Perform a complete volumetric analysis of the quarry based on a to-be-determined top elevation utilizing multi-frequency acoustical sub-bottom profiling to establish the depth and existing loose sediment thickness over the quarry bottom.

10. Perform a Dual Frequency Acoustical Sub-Bottom profile under the supervision of a qualified Geophysicist. The use of Dual Frequency Acoustical geophysics works similarly to a simple fathometer with the added advantage of being able to measure the thickness of fill material to thicknesses of approximately 40 feet.

11. Perform a Dual-Frequency Bathymetry which is required to map the water bottom (mud line) and thickness of upper (<20 ft) loose sediments. The bathymetric data and loose sediment thickness will be provided by a Tritech Sea-King Parametric Sub-Bottom Profiler. This instrument is a dual-frequency echo sounder that operates at 200 kHz and 20 kHz. The high frequency signal is used to provide a high-resolution image of the bottom, while the low frequency signal is used to image up to 30 feet into soft sediments. Applications of the instrument include bathymetric mapping and sediment thickness mapping. The following figure shows an example of the data used to find zones of thick silt at the bottom of a sand and gravel quarry.

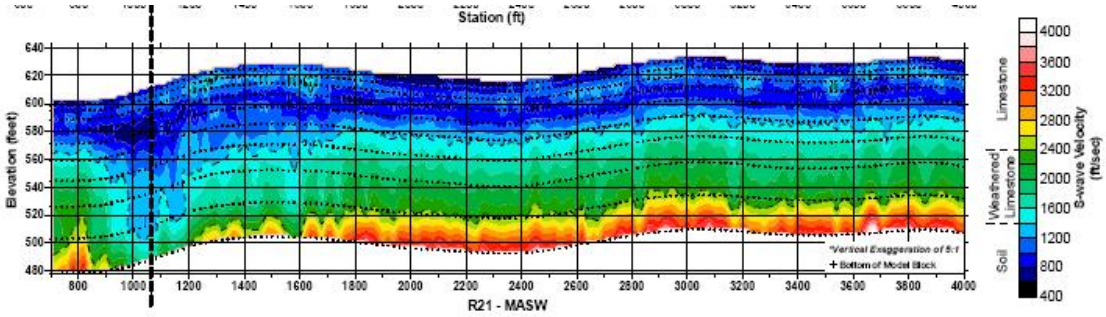


Thicker zones of loose silty-clay on bottom identified with low-frequency echo sounder data and verified with core sample

This data is used for the future management of the two quarry basins, including the evaluation of sedimentation fill rates, and potential hazardous conditions that may be present as a result of the abandoned mining operations. It is estimated that it will take one approximately week to complete this scope.

12. Seismic Evaluations – Provide complete Refraction or MASW seismic profiles along the edges of the proposed quarry embankment

location using a 24-channel Geometrics Seismograph setup for Refraction and MASW data collection and analysis. The product will consist of a collection of at least one MASW seismic profile similar to the one shown below:



Seismic shear-wave velocity is a key parameter for determining the elastic properties of soil and rock for geotechnical investigations. In-situ measurements of shear-wave velocity are traditionally made with seismic cross-hole methods or through non-invasive methods such as Spectral Analysis of Surface Waves (SASW). A relatively new improvement to SASW known as Multi-Channel Analysis of Surface Waves (MASW) which allows shear-wave measurements to be made at multiple locations (e.g. along a profile line or survey grid) in a much more efficient and cost effective manner. Shear-wave velocity values obtained with MASW have been shown to agree with borehole measurements in unconsolidated materials to within 15%. The benefits of MASW are extremely useful since the shear-wave velocities can be measured to depths of 100 feet (and even greater with passive sources). The measurements are non-invasive and can provide coverage over large areas such as the Teer Quarry site for reconnaissance investigations. It can identify features that other geophysical methods may miss, such as soft (low-velocity) layers below hard (high-velocity) layers.

The Seismic refraction evaluation requires approximately the same level of effort as MASW. For both methods we estimate 2,000 linear feet of survey per day, and one day of data processing per day of data collection for approximately 5 days of field work per survey type and a total of 10 days of office time to process the data and prepare reports.

13. Geotechnical Drilling: The geotechnical firm will perform a joint site visit with the City, Engineer, Land Surveyor, and SUE firm to stake the proposed geotechnical borings locations in advance of performing any boring work on the quarry site. The City will be given ample opportunity to excavate several locations of the existing 42" raw water pipeline in advance of any geotechnical work being performed. The planned boring program is as follows:

    - Existing raw water intake pump station: 2 shallow borings (B1 and B2) approximately 20-feet deep each.

- North embankment of the quarry reservoir: approximately eight (8) borings (200-feet apart) B3 through B10. Four borings will be drilled to approximately 100-feet depth and the other four (4) [alternate] borings to approximately 150-feet depth or 10-feet below the bottom of quarry.
- Proposed raw water pipeline and pumping structure area: Five (5) borings B11 through B15. Three (3) borings to a depth of 100-feet and two borings to a depth of 150-feet.
- Existing 42-inch raw water pipeline: Approximately five (5) borings (B16 through B20) to a shallow depth of 15-feet each to determine the ground conditions along the pipeline for any future replacements.
- Approximately twelve (12) borings (200-feet apart) along the western perimeter of the quarry reservoir (B21 through B32). Six (6) of these borings will go 100-feet deep in rock and the other six (6) to 150-feet or 10-feet below the bottom of quarry.
- Four (4) borings B33 through B36 (2 each) at the proposed two raw water intake pipelines from the Eno River at northwest corner of the quarry site. These borings are estimated to go 15-feet in depth each.
- Perform these services utilizing at least one ATV rig on tracks to reach out to all difficult terrain locations. Most soil borings will be advanced using hollow stem auger drilling with split spoon samples every 5-feet apart as per ASTM D1586 standards in the overburden, which is not expected to be significant. A majority of the work will involve rock drilling and coring and an air rotary rig may be used for this drilling.

14. All field work will be inspected by a licensed Geologist or Geophysicist to make necessary adjustments are made and to take field logs and samples. Groundwater, if any, will be monitored upon completion of each hole. All borings will be backfilled using drill cuttings and all rock cored holes will be grouted with cement-bentonite slurry.

15. Slug Tests and Packer Tests will be performed in selected borings going 100 to 150-feet in depth at intervals of 10 to 15-feet each. The Packer Test procedures are listed below:

    - Data Review and Work-Plan Development - Under this task, review the boring logs from the current geotechnical investigation and other previous investigations to develop a work plan for conducting the packer tests. A review of this data will help to identify fracture zones and other preferential groundwater flow pathways for packer testing and assist in estimating injection rates for the packer testing. The work plan will outline the methodology for conducting the packer tests and the targeted intervals and boreholes to be tested. The work plan will also include a Health and Safety Plan.

    - Field Investigation - After completion of the drilling, mobilize to the site to begin the field activities. Initially, a slug test will

be performed at each borehole to determine the average hydraulic conductivity of the bedrock and to further establish which boreholes to conduct the packer tests. After review of the slug test data, packer tests will be conducted at selected boreholes and depth intervals. The packer tests will be conducted using double packer assemblies to isolate the selected testing intervals. Packer tests will be conducted on the entire depth of up to four (4) boreholes to determine hydraulic conductivity of both fractured and un-fractured zones. In the remaining boreholes, up to two (2) packer tests will be conducted at selected intervals at each borehole. This process assumes that the boring logs reviewed in herein provide sufficient detail to identify the fracture zones. There will be ten (10) boreholes to 100-feet and ten (10) boreholes to 150-feet in depth. Slug testing can be completed in seven (7) days and packer testing can be completed in fifteen (15) days, after drilling is complete.

- Reporting - After completion of the field work, perform an analysis of the data from the packer tests to determine permeability based on flow rates and pressures. The information will be included in the S-PER and will describe the methods of investigation and the results of the data analysis.
- Alternative Approach - If the targeted intervals for packer testing cannot accurately be determined by the review of the borings logs, then it may be necessary to conduct a downhole geophysical survey using an acoustic televiewer to identify the fracture zones for packer testing.
    - All drilled soil samples will be properly labeled and stored in Ziploc bags and all rock core samples will be labeled and stored in cardboard boxes and then shipped to the laboratory for proper analysis.
    - Soil samples will be tested for moisture, gradation, Atterberg limits, soil resistivity, and pH value.
    - Upon completion of all laboratory analysis, a geologist and engineer will work together to prepare the geotechnical report:

Proposed Boring Chart:

Boring numbers	Total Quantity	Soil burden per boring(assumed)	Total soil drilling	Rock coring per boring(assumed)	Total rock coring	Total depth
B1, B2	2	10	20	10	20	40
B3, B5, B7, B9	4	10	40	140	560	600
B4, B6, B8, B10	4	10	40	90	360	400
B11, B13, B15,	3	10	30	90	270	300
B12, B14	2	10	20	140	280	300
B16 through B20	5	10	50	5	25	75
B21, B23, B25, B27, B29, B31	6	10	60	140	840	900
B22, B24, B26, B28, B30, B32	6	10	60	90	540	600
B33 through B36	4	10	40	5	20	60
TOTAL	**36**		**360**		**2915**	**3275**

II.A.7. INITIAL SUBSURFACE UTILITY EXPLORATION (S.U.E.)

1. A (LEVEL B) **S**ubsurface **U**tility **E**xploration (SUE) will be performed in the immediate areas where the existing 42” raw water pipeline and the existing 24” finished waterline are understood to be.

2. Due to the extreme importance of the existing 42” raw water pipeline located on the quarry site, a higher level of SUE (LEVEL A) will also be required for locating the existing 42” raw water pipeline and the existing 24” finished waterline throughout the quarry site, where connections to the existing 42” raw water pipeline will occur, and where the existing 42” raw water pipeline may be in conflict with

recommended improvements such as the installation of an earthen embankment or a pumping facility. It is estimated that six (6) Level A SUE borings approximately 18-feet deep each will be required to located the existing 42" raw water pipeline in advance of performing any required geotechnical borings. Any additional Level A borings will be considered Additional Services under Article II.A.9, herein below.

3. The SUE surveys will be performed by GEL, Inc., a SUE company who will coordinate with NC-One Call, the City of Durham, and other individual utilities to field mark the locations of all utilities within the project site. The SUE firm will also coordinate with the land surveyor to locate and tie the existing utilities to the NC Grid system.

II.A.8 MISCELLANEOUS DESIGN SERVICES

1. Work associated with Miscellaneous Design Services shall be performed only at the written direction and authorization of the City of Durham Department of Water Management for design and subconsultant services beyond the anticipated project scope. The City will detail the scope of services for the work to be performed.

II.A.9 ADDITIONAL SERVICES

The following items of Work will be provided by Kimley-Horn as Additional Services:

1. Additional Level A SUE for utility locations
2. Surveying services required for the delineation of species trees
3. Environmental or Arborist services required for the identification and delineation of species trees
4. Wetland/stream mitigation site selection and design (if necessary)
5. SEPA Environmental Assessment (EA) or Categorical Exclusion
6. NEPA Environmental Documentations
7. Cultural Resources surveys (historical/archaeological)
8. Protected species surveys
9. Provide quantitative analysis of indirect and cumulative impacts
10. Attendance at additional meetings such as public hearings
11. Environmental Impact Statements (EIS)
12. HEC-Studies
13. Application fees for regulatory permits
14. Additional services not included in the above

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ESTIMATED COST

Based on the above information and our experience on other similar recent projects, Kimley-Horn will perform the required Scope of Services for the City of Durham's Teer Quarry Raw Water Storage and Pumping Facility – Preliminary Site Design Phase, for the costs indicated in the tables below:

II.A.1 INITIAL SITE/CIVIL ENGINEERING SERVICES

Task	Description of Service	Fee
1	Perform hydraulic evaluations and conceptual designs for the proposed Phase I facilities	$22,000
2	Perform an evaluation for the feasibility of utilizing temporary "stand-by" Godwin type trailer mounted pumps	$4,000
3	Perform a limited hydraulic analysis and pipeline capacity and condition assessments of the existing 42" raw water pipeline	$4,000
4	Perform an evaluation of the multiple control valve options required to permit water to be conveyed into and out of the quarry	$4,000
5	Perform an evaluation of the viable options for converting the Teer Quarry Phase I facilities from an emergency off-line water storage facility to an on-line fully operational facility	$6,000
6	Perform an evaluation of the feasibility of installing an earthen embankment required to provide for the containment of water in the quarry up to the desired Elev. 285.00 capacity level	$8,000
7	Perform an evaluation of any additional property acquisition(s) required for placing an earthen embankment on the site	$4,000
8	Perform an evaluation of the potential effects of placing additional fill materials required for the installation of an earthen embankment, on the existing 42" PCCP raw water pipeline	$1,000
9	Perform an evaluation of the security requirements necessary to secure the site	$3,500
10	Perform an assessment of the potential *alternative potential funding sources* under the state's SRF "Green Funds" program	$5,000
11	Identify all of the required regulatory and environmental permits necessary for the Teer Quarry Phase I facilities and the Teer Quarry Phase II facilities.	[See II.A.2]
12	Provide an updated Supplemental Preliminary Engineering Report (S-PER)	$12,000

Task	Description of Service	Fee
13	Provide an accurate and detailed opinion of probable construction costs (OPCC) for the updated requirements	$3,000
14	Provide property owner notification letters for the properties identified to require preliminary site investigations requiring a “Right of Entry” letter to access the property	$2,800
15	The Scope of Services will include four (4) review and coordination meetings with City staff during the preliminary engineering services phase	$4,500
	Subtotal	$83,800
	Expenses	$5,200
	Total KHA Fee	**$89,000**

II.A.2 INITIAL ENVIRONMENTAL EVALUATIONS AND REGULATORY REVIEWS

Task	Description of Service	Fee
1	Wetland and Streams Delineation	$8,000
2	Streams Buffer Conformance	$4,000
3	Wetland and Stream Mapping	$8,000
4	Apply for certification of the surveyed wetlands line and streams	$6,400
5	Regulatory and Environmental Permit Reviews	$11,600
6	Apply to DWQ for surface water classification of the quarry site as a “Drinking Water Source”	$8,000
	Subtotal	$46,000
	Expenses	$2,000
	Total KHA Fee	**$48,000**

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II.A.3 INITIAL STRUCTURAL EVALUATIONS

Task	Description of Service	Fee
1	Perform a preliminary evaluation of the various structural components associated with the Teer Quarry Phase I facilities and for conversion of the facility to an on-line fully operational facility referred to as the Teer Quarry Phase II facilities	$25,000
2	Review preliminary geotechnical information and recommendations for potential structures	$5,000
3	Develop preliminary structural plans	$40,000
4	Develop preliminary designs for required retaining walls, and for any earthen embankment features	$8,000
5	Perform internal QA/QC reviews and address any final comments	$2,000
6	Prepare an OPCC for the structural components including quantity take-offs and costs	$3,000
	Subtotal	$83,000
	Expenses	$3,000
	Total KHA Fee	**$86,000**

II.A.4 INITIAL ELECTRICAL EVALUATIONS

Description	Apogee Consulting Group
Perform a preliminary evaluation of the sizable electrical requirements for providing adequate power to the quarry site	$8,000
Perform an evaluation of the existing electrical facilities at the Eno River Pump Station and the treatment plant both located on the quarry site.	$5,000
Total Fee	**$13,000**

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II.A.5 INITIAL SURVEYING SERVICES

Task	Description of Service	Fee
1	Perform boundary survey computations and ties to the North Carolina Grid Coordinate System and USGS for vertical controls, setting of property irons at all of the City of Durham property corners within the quarry site and setting of temporary bench marks (TBM's)	$2,200
2	Conduct deed research in accordance with the requirements of Durham County and the City of Durham	$1,200
3	Preparation of topographical and location surveys of the entire rim of the quarry	$46,300
4	Locate the existing 42" and 24" pipelines that traverse the Teer Quarry site	$8,400
5	Preparation of topographical and location surveys for three (3) potential gravity raw water pipeline alignments approximately 40-feet wide	$8,000
6	Locating wetlands and streams and flagging the same for environmental evaluations.	$2,200
7	Obtain sufficient information for Kimley-Horn to develop a potential permanent, unrestricted access road to the quarry site	$4,800
8	Preparation of topographical and location surveys of up to three (3) 1-acre sites	$7,200
9	Preparation of topographical and location surveys of up to two acres for the potential Teer Quarry Raw Water Pump Station facility location.	$4,800
10	Provide cross-section surveys of the Eno River at the selected gravity locations and the proposed raw water pump stations	$7,500
11	Provide staking of approximately 50 geotechnical and SUE boring locations	$6,000
	Subtotal	**$98,600**

II.A.6 INITIAL SUBSURFACE GEOTECHNICAL INVESTIGATION

Task	Description of Service	Fee
1	Perform a review of the complete records of the Nello Teer Quarry's annual reports	$5,750
2	Perform a preliminary site visit to walk through the site	$1,725
3	Review the background history on the quarry and any and all field investigation work done to date	$9,200
4	Conduct a geophysical instrumentation survey of the site	$34,500
5	Perform an evaluation of existing data base to better identify the concerns that may need additional evaluation	$9,200
6	Perform a complete multi-frequency acoustical sub-bottom profile	$13,800
7	Perform a complete shallow surface geophysics evaluation	$13,800
8	Perform a review of existing North Carolina Land Management mine records	$9,200
9	Perform a complete volumetric analysis of the quarry	$13,800
10	Perform a Dual Frequency Acoustical Sub-Bottom profile	$13,800
11	Perform a Dual-Frequency Bathymetry	$13,800
12	Provide complete Refraction or MASW seismic profiles	$6,900
13	Geotechnical Drilling and Laboratory Testing	$251,965
14	Field work inspections	$41,400
15	Slug Tests and Packer Tests	$70,380
	Subtotal	**$509,220**

II.A.7. INITIAL SUBSURFACE UTILITY EXPLORATION (S.U.E.)

Description	GEL Geophysics, LLC
SUE Level B Services	$10,000*
SUE Level A Services	$5,000*
Subtotal	**$15,000***
***SUE costs are estimated and may change depending on the extent and field conditions.	

II.A.8 Miscellaneous Design Requirements

Description	TBD
Design and Subconsultant Services Beyond Anticipated Project Scope	**$85,000**

SUMMARY

BASIS FOR COMPENSATION		
Services	**Cost Ceiling**	**Lump Sum**
II.A.1 – Initial Site/Civil Engineering Services	$89,000	N/A
II.A.2 – Initial Environmental Evaluations and Regulatory Reviews	$48,000	N/A
II.A.3 – Initial Structural Evaluations	$86,000	N/A
II.A.4 – Initial Electrical Evaluations	$13,000	N/A
II.A.5 – Initial Surveying Services	$98,600	N/A
II.A.6 – Initial Subsurface Geotechnical Evaluation	$509,220	N/A
II.A.7 – Initial Subsurface Exploration	$15,000	N/A
II.A.8 Miscellaneous Design Services	$85,000	N/A
Project Totals	$943,820	N/A
Total Cost Ceiling = $943,820		

SCHEDULE

Kimley-Horn is available to begin work on this project immediately upon authorization by the City of Durham. Our workload and staff availability is such that we can assign more than sufficient professionals and technical staff to complete the preliminary design phase services indicated hereinabove in a timely manner**.** The work to be performed and the services to be rendered under this Scope of Services shall commence on a date as directed by the City of Durham.

We appreciate the opportunity to submit our Scope of Services to the City of Durham. We would be happy to answer any questions that you might have concerning our proposed Scope.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Kevin F. Carter

Kevin F. Carter, P.E.
Senior Associate/Senior Project Manager